[Poster Board # F25] Effect Of Short-term Cigarette Smoke Exposure In Vitamin D Deficient Mice On Muscle Function And Bone, [Publication Page: A4848]

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Leuven/BE

	NC	NS	DC	DS
Muscle mass EDL (mg)	0,011 ± 0,002	0,010 ± 0,001	0,012 ± 0,001	0,011 ± 0,001
Muscle mass SO (mg)	0,010 ± 0,001	0,009 ± 0,001	0,011 ± 0,001	0,009 ± 0,002
Force				
EDL twitch (g/cm²)	349 ± 63	352 ± 38	288 ± 53	356 ± 80
EDL tetanic (g/cm²)	4453 ± 693	3984 ± 604	3630 ± 689	4203 ± 814
SO twitch (g/cm²)	296 ± 100	415 ± 256	292 ± 108	371 ± 142
SO tetanic (g/cm²)	2659 ± 690	2722 ± 259	2690 ± 662	2932 ± 603

Rationale: Some patients with COPD are more prone to develop skeletal muscle weakness. Vitamin D, essential for maintaining skeletal muscle function and bone homeostasis in healthy individuals, is low in the majority of COPD patients. The aim of our study was to examine if vitamin D deficiency has negative effects on skeletal muscle function and bone structure in a mouse model of COPD.

Methods: Vitamin D deficient C57Bl/6 mice receiving a high calcium diet were randomly divided to breath room air (DC) or to be daily exposed to cigarette smoke (2x4 cigarettes/day, nose only (Scireq)) (DS) for 5 days a week during 6 weeks. Mice with normal vitamin D levels exposed to room air (NC) or cigarette smoke (NS) were used as controls. Body weight was measured weekly. Lung function, muscle mass, muscle histology and contractile properties of m.soleus and m.extensor digitorum longus were assessed after 6 weeks, as well as the bone composition using micro-computed tomography.

Results: Body weight gain was significantly reduced in animals exposed to cigarette smoke (NS:-1±3%; DS:3±4%) compared to non-smoking animals (NC:10±8%; DC:15±4%). 6 weeks of cigarette exposure resulted in a non-significant increase of total lung capacity (NS:14±13%; DS:23±16%) and increased lung compliance (NS:10±12%; DS:24±20%)with no differences between the vitamin D deficient and sufficient groups. Muscle mass of peripheral muscles was not affected by smoking or vitamin D deficiency (table 1). Similarly, contractile properties, fatigability and fiber dimensions and proportions of the peripheral muscles did not differ between the groups after 6 weeks of smoking (table 1). Smoking tended to reduce cortical thickness in the vitamin D deficient mice (DS: -7±5%, $p<0.05$) while no difference was observed in the non-deficient animals.

Conclusions: Short-term cigarette smoke exposure in vitamin D deficient mice does not cause early alterations in lung function and peripheral muscle function, whilst cortical bone may appear to be more vulnerable. A prolonged period of smoke exposure is needed to study if vitamin D deficiency may be harmful in chronic model of COPD.

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Poster Viewing: 10:45 AM - 12:30 PM
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